TRANSACTIONS

OF

THE LINNEAN SOCIETY.

I. *Description of the Organ of Voice in a new Species of Wild Swan* (Cygnus Buccinator, *Richardson*). *By* WILLIAM YARRELL, *Esq.*, *F.L.S. & Z.S.*

Read March 20th, 1832.

I AM indebted to the liberality and kindness of Dr. Richardson for an example of the sternum and trachea of a new species of wild swan, the *Cygnus Buccinator* of the *Fauna Boreali-Americana*, Part II., of Mr. Swainson and Dr. Richardson; a work in ornithology unexampled for beauty of illustration and accuracy of detail.

The possession of this valuable and probably unique specimen affords me an opportunity of placing before the members of the Linnean Society the following description and drawing.

The interesting variations which will be observed in the organ of voice in this newly discovered species, as compared with the same parts in other known swans, is an additional proof of the value of internal evidence as decisive of specific distinction; and it is particularly worthy of notice, that as the shape and colour of the beak; the number of the tail-feathers; the course of the tube of the trachea within the cavity of the sternum; and the form of the bronchiæ;—from the modifications observed in them all;—have been considered satisfactory as establishing the claim of *Cygnus Bewickii* to rank as a species distinct from the Hooper: the same parts, external as well as

internal, in *Cygnus Buccinator*, will be found to be all equally distinct from both.

Cygnus Buccinator is the most common swan in the interior of the fur-countries of North America; and it is to this species, which is called the Trumpeter, that the largest portion of the swan-skins imported by the Hudson's Bay Company belong.

These swans probably require five or six years to arrive at their full size; but this point attained, they are considerably larger than the oldest Hooper.

The beak of the Trumpeter is entirely black, without any of the yellow-orange colour so conspicuous in the Hooper and Bewick's swan; and, being at the same time larger, longer, and more depressed, at once distinguishes this new species.

The forehead alone is tinged with rust-colour, and this tint prevails over a larger space in younger specimens; the rest of the plumage is pure white: the third quill-feather of the wing is the longest; the tail-feathers 24 in number; the legs black.

The trachea is made up of narrow bony rings and small intervening membranous spaces as far as the first convolution within the breast-bone, but the returning portion of the tube, forming a second convolution, is composed of broader and stronger bony rings with wider intervals. In these peculiarities of structure it resembles the trachea of the Hooper; but in its course within the sternum, as also in the form of the bronchiæ, it is decidedly different.

The trachea, after descending by the neck, passes backwards within the keel and between the two plates of the breast-bone to the depth of six inches, then curving horizontally and slightly inclining upwards, returns, at first by the side of, and afterwards over, the first inserted portion, near two thirds of the whole distance. A second curve of this returning portion is then suddenly elevated two inches above the line of the superior surface of the keel, and traverses the interior of a hollow circular protuberance on the dorsal surface of the sternum itself. The usual ascending curve of the trachea then ensues, by which the tube, ultimately receding, gains the internal cavity of the breast. The bone of divarication is placed over the centre of the protuberance before mentioned. The bronchiæ are but two inches each in length, small at their

origin and at their junction with the lungs, but greatly expanded throughout the intermediate portions, and somewhat depressed, being one inch one line wide, and only eight lines in depth.

The muscles of voice are the same in number and situation as in the Hooper and *Cygnus Bewickii.*

The whole length of the sternum is nine inches three lines, the greatest width four inches; the hollow protuberance on its internal surface is formed by a sudden rounded elevation of the superior bony plate, which is compressed at the sides, and measures in length as also in height one inch six lines, and in width nine lines; from the edge of the keel to the upper surface of the protuberance three inches five lines.

The following other measurements are here inserted for comparison with those of our British wild swans in the last-published Part of the Transactions of this Society.

	Inches.	Lines.
Point of beak to the end of the tail	70	0
——————— edge of the forehead . . .	4	11
——————— eye	6	0
——————— occiput	8	0
Carpus to the end of the primaries	24	0
Tail-feathers, in number, 24.		
Length of tarsus	4	6
——————— middle toe and nail	6	9
——————— the breast-bone	9	3
Depth of insertion of the trachea	6	0
Length of the bronchial tubes	2	0

A fine preserved specimen of the Trumpeter in the museum of the Hudson's Bay Company, in Fenchurch Street, afforded the external measurements here detailed. Two skins of swans of the same species in the collection of the Zoological Society are from younger birds, and are somewhat smaller in their several dimensions.

The Hooper, it will be recollected, has but one decided convolution of the trachea within the sternum, and that one is vertical; Bewick's swan has also but one convolution, and that horizontal; our present subject, it will be seen,

has two convolutions within the sternum, of very opposite character in their directions; the bronchiæ also differ materially from both. The representations of the various parts, on comparison with those already published, will render these differences much more apparent than this concise description; and the examination of them will, I trust, convince ornithologists that the *Cygnus Buccinator* of Dr. Richardson is a species perfectly distinct from any hitherto made known.

EXPLANATION OF TAB. I.

Fig. 1. Side view of the sternum, a section having been made to show the trachea in its natural situation.
2. The anterior portion of the sternum, seen from above.
3. The inside of the hollow protuberance.
4. The protuberance, seen from the right side.
5. The bronchiæ, seen from the side.
6. The bronchiæ, seen from above.
7. The bone of divarication, side view.
8. The same bone, seen from above.
9. The muscle of voice in its course along the tube of the trachea.